# Issues in Yellowstone

Summer 2001

## The Northern Range Controversy

NPS/Schmidt

Visitors to Yellowstone may hear differing opinions about the condition of the northern part of the park, also called the Northern Range. Some people insist the Northern Range is overgrazed by the park's hoofed animals (ungulates such as elk).You may see conditions that make you think this might be true. What you see, however, is not necessarily what it seems to be.

### History

In the early twentieth century, wildlife management practices encouraged the attitude that wildlife was either good or bad. This view led to the elimination of many predators from most of the western United States, including Yellowstone, and a subsequent increase in ungulates.

By the early 1930s, scientists and managers believed wildlife grazing and drought in the early part of the century had reduced the ability of the Northern Range to support ungulates. They also believed that twice as many elk were on the range in 1932 as in 1914. And so, until 1968, the park artificially controlled elk, pronghorn, and bison populations by shooting or trapping and removing them.

By the 1960s, scientists and wildlife managers had also begun to understand the complex interconnections among and between living and non-living components in the world around us. Many definitive studies describing the young science of ecology were conducted. Based on these studies, many scientists involved with Yellowstone believed the elk and other wildlife using the Northern Range could be self-regulating. In 1968, a policy often called "natural regulation" was instituted. Along with this new policy, intensive studies began of many aspects of the Northern Range.

### Points of View

In part, the controversy is due to the personal or scientific background of each person. Many urban dwellers live among intensively managed surroundings such as manicured lawns and community parks; they are not used to wild, natural ecosystems. Livestock managers and range scientists tend to view the landscape economically, intensively manipulating the land to maximize the number of animals a unit of land can sustain. Many ecologists and wilderness managers, on the other hand, believe the ecological carrying capacity of a landscape is quite different from range or economic carrying capacity. They believe that the only constants in a naturally functioning wilderness ecosystem are variability and change. What may look bad, in fact, may be normal for a wild landscape.

### Research Findings

Many intensive studies of the Northern Range have revealed no clear evidence of grassland overuse. In fact, ungulate grazing enhances the protein content of grasses, the yearly growth of big sagebrush, and the establishment of sagebrush seedlings. Neither a reduction in root biomass nor an increase in dead bunchgrass clumps has been observed. The relationship between ungulates, aspen, and willow are not so clear, and more research is needed.

The major factor influencing the size of the Northern Range elk population appears to be winter severity. Mild winters allow many more elk to survive until spring, but severe winters result in significant levels of winter kill for many animals, not just elk. In severe winters, one-quarter of the herd can die. Many scientists believe the northern Yellowstone elk herd demonstrates the ecological principle of density-dependence: mortality of calves, yearlings, and adult bulls all increase with higher elk population densities.

Elk are also continuously subjected to predation by other species, including bears, wolves, coyotes, and mountain lions. The complex interdependence of these relationships results in fluctuations in the elk population. When there are lots of elk, predator numbers increase, which, in part, helps to reduce elk numbers. In the past decade, elk have continued to colonize new winter ranges north of the park as areas have been set aside for this purpose, and summers have been wet (resulting in better plant production) while winters have been generally mild. The fires of 1988 also opened many forest canopies, allowing more grasses to grow. All of these factors have increased elk survival.

National Park Service policies not only protect native species but also preserve natural ecological processes. Wherever possible, human intervention is discouraged. While controversy continues about the Northern Range and Park Service management practices, so does the ecological research on the complex relationships between the landscape and its native wildlife.

## Watch Out for Exotic Invaders

### Lake Trout

Yellowstone Lake is the core of the remaining undisturbed, natural habitat for Yellowstone cutthroat trout, which today survives in about 15% of its historic range. Because cutthroat trout live mainly in near-shore waters and spawn in tributary streams of the lake, as many as 42 species of birds and mammals—such as grizzly bears, raccoons, otters, white pelicans, bald eagles, and osprey—may depend on the cutthroat as a food source.

In 1994, this delicate web of life was threatened when lake trout (or Mackinaw) were discovered in Yellowstone Lake. Lake trout, native to the Great Lakes and other northern areas of North America, pose two threats to the ecosystem:

1.They eat cutthroats.
2.They do not spawn in shallow water where predators can catch them.

Since 1994, control efforts have removed approximately 27,000 lake trout. Anglers have had success catching lake trout that are between 15 and 20 inches long because these fish are found in shallow, near-shore waters in June and early July.

### Whirling Disease

This disease is caused by a microscopic parasite that destroys the cartilage of juvenile trout, which may cause them to swim in a whirling motion (as if chasing their tail). Seriously infected fish have a reduced ability to feed or escape from predators, and many die. The whirling disease parasite is native to Europe. Young rainbow trout and cutthroat trout appear to be very vulnerable to the disease. Older fish and other species of trout are less susceptible (or possibly immune), but may carry the disease.

### New Zealand Mud Snail

This tiny (less than 1/4 inch—see photo below) snail occurs in the Firehole, Gibbon, Madison, and Snake rivers. It often forms dense colonies on aquatic vegetation and rocks along stream-beds, crowding out native aquatic insect communities that are a primary food source for fish. Scientists are developing strategies for dealing with this invader.

NPS/Cawley

NPS/Dunmire

### Non-Native Plants

Aggressive non-native plant species like Dalmation toadflax (above) are displacing native species at an alarming rate and could seriously affect the park's native plant communities, wildlife populations, and even thermal areas.

Non-native plant seeds spread on:
- muddy shoes and boots
- vehicles that have driven through "weedy" areas with seeds
- dirty construction equipment
- weed-infested hay
- contaminated sand and gravel used in road projects

Species of particular concern include Dalmation toadflax, spotted knapweed, Canada thistle, ox-eye daisy, houndstongue, and leafy spurge.

## You Can Help

### Whirling Disease & Mud Snails

- Rinse mud, plants, and debris from all angling gear, footwear, boats, and other items used in the water before you enter Yellowstone and after leaving each water body within the park. Thoroughly inspect your gear.
- Dispose of fish entrails and snails in a waste container where the fish or snails were taken. Do not transport fish parts, except what you will consume, outside the watershed where you caught the fish.

### Lake Trout

Fish for lake trout in Yellowstone Lake during June, early July, late September and early October when the fish frequent the north and southeast shores of West Thumb. At these times, many lake trout are in waters that are 10 to 20 feet deep. Lake trout are attracted to medium-sized lures that imitate small fish. ***If you catch a lake trout in Yellowstone Lake and its tributaries—including the Yellowstone River—you must kill the fish.***

### Non-Native Plants

If you see any of the problem plants mentioned, especially in the back country, please report them to a ranger at any visitor center or ranger station.